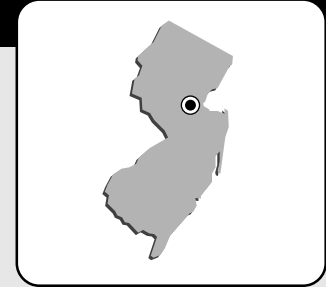


# COLTS NECK NAVAL WEAPONS STATION EARLE

## COLTS NECK, NEW JERSEY

Engineering Field Division/Activity: NORTHDIV  
 Major Claimant: COMNAVSEASYSKOM  
 Size: 706 Acres Shoreside and 10,428 Acres Inland  
 Funding to Date: \$12,967,000  
 Estimated Funding to Complete: \$21,918,000



Base Mission: Provides handling, storage, renovations and transshipment of munitions

Contaminants: Base-neutral and acid extractable organics, heavy metals, POLs, volatile organic compounds

Number of Sites:	Relative Risk Ranking of Sites:				
CERCLA:	43	High:	17	Not Evaluated:	0
RCRA Corrective Action:	3	Medium:	4	Not Required:	36
RCRA UST:	21	Low:	10		
Total Sites:	67				

**NPL**

Sites Response Complete: 36

### EXECUTIVE SUMMARY

Naval Weapons Station (NWS) Earle is in the town of Colts Neck, county of Monmouth, New Jersey and is 47 miles south of New York City. NWS consists of 10,428 acres in the Main Base area and 706 acres in the Waterfront and Chapel Hill areas.

Earle NWS was placed on the National Priorities List (NPL) because of numerous landfills and a history of ordnance maintenance and disposal operations. Sites 4, 5, 19 and 26 are considered most imperative. Contaminants of concern are ordnance materials, grit, paint, paint scrapings, solvents, paint sludges, ammonium picrate, lead bullets, zinc, lead and chromium. Areas of contamination include landfills, disposal areas, storage areas, abandoned pistol ranges, spill sites and underground storage tanks. Current operations utilize pollution prevention technologies to prevent further contamination. NWS is under a Federal Facility Agreement (FFA) with the EPA which was signed in 1990 and became effective in 1991.

NWS lies within the Outer Coastal Plain and is in an area of low relief, about six miles inland from the Atlantic Ocean. Three major rivers; the Shark River, the Manasquan River and the Swimming River, receive drainage from the Main Base. Land use in the area surrounding the Main Base is principally agricultural and vacant land, with strip development of commercial and residential land along the highways. Precipitation results in both surface water runoff to nearby streams and wetlands and in infiltration to recharge the aquifers. Much of the station is forested with streams and river flood plains and low-lying wetland areas, including fresh water swamps and salt water marshes. Major portions of the station have been identified as habitat for numerous rare species. Local surface water is used for recreation and irrigation purposes. Groundwater contamination is the primary community concern because residential wells are present on several nearby properties. Monitoring wells have been installed around the base to determine the presence of contamination and direction of groundwater flow.

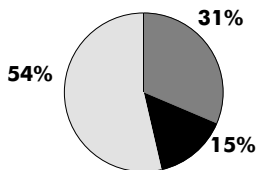
A Technical Review Committee (TRC) was formed in FY90 and was converted to a Restoration Advisory Board (RAB) in FY95. A Community Relations Plan (CRP) was issued in FY90 and is currently being updated to reflect findings of the RI Addendum as well as completed Removal Actions. An Information Repository, containing copies of Administrative Record documents, was established in FY90.

Sixty-seven sites have been identified at NWS. Forty-three are being handled under CERCLA. Twenty-one are being cleaned up or closed out under RCRA Underground Storage Tank (UST). Three have been studied and remediated under RCRA Corrective Action. Site 21 is an active RCRA permitted storage area. A RCRA Subpart X Permit is currently under review for Site 2.

At the end of FY97, 26 sites were in the Study Phase, six sites were in the Cleanup Phase and 36 sites are Response Complete (RC). In FY91, the installation initiated Remedial Investigation/Feasibility Study (RI/FS) activities. An interim RI draft report submitted in FY92 recommended cleanup for 10 sites, including capping, removal, or Long Term Monitoring (LTM). First round RI/FS activities were completed in late FY93. Decisions on the sites were deferred until adequate background and watershed data were obtained as part of the second portion of the RI/FS in FY97 for the remaining sites.

A total of 21 USTs have been identified at this installation. Removal Actions for several UST sites were completed in FY93. One UST site was investigated in FY91 and closed in FY92. Sixteen of the remaining twenty UST sites are proposed for No Further Action (NFA) based on the results of RIs which were completed in FY96. A pilot study was conducted to determine the optimum method for removal of a free-product layer at CERCLA Site 16. It will be expanded into an integrated RA for this site and nearby UST 5. EPA and NJDEP have agreed to this remediation approach. Bioremediation plans for USTs 2, 7 and 9 were developed in FY97.

#### Current Status Of Sites



■ Studies Underway	21
■ Cleanups Underway	10
□ Response Complete	36
<b>TOTALS</b>	<b>67</b>

## COLTS NECK NWS EARLE RELEVANT ISSUES

### ENVIRONMENTAL RISK



**HYDROGEOLOGY** - The Main Base is located at the head waters of three major river systems. These rivers are the Manasquan, the Shark and the Swimming. There are wetlands, floodplains and small ponds located on NWS. Drainage from the Waterfront and Chapel Hill areas enters three minor streams. These streams, Wagner Creek, Ware Creek and Comptons Creek, drain into Sandy Hook Bay. The fresh groundwater in the unconsolidated formations underlying NWS is derived solely from precipitation over the outcrop areas. Rainfall lost to evaporation and overland flow results in approximately 40% of the rainfall infiltrating as recharge to the groundwater reservoir. With an annual rainfall of about 45 inches per year, this recharge amounts to slightly less than 20 inches.

The Waterfront and Chapel Hill areas overlie the older unconsolidated New Jersey Coastal Plain deposits. There are two principal aquifers that could be affected by contaminant migration from the Main Base (the Vincentown Formation and the Kirkwood Formation). Neither of these aquifers are used for public water supply within five miles of the Main Base, but they are used for domestic water supplies in areas without public water systems. Communities surrounding the Waterfront and Chapel Hill areas obtain drinking water from the Monmouth Consolidated Water Company system that uses deep wells and surface reservoirs. Adjacent homes are part of this system and do not have domestic wells. Waste disposal activities at the Waterfront and Chapel Hill areas would not affect private or public wells. Monitoring wells have been installed throughout the base to determine the presence of contamination, contaminant levels and the direction of the localized groundwater flow.



**NATURAL RESOURCES** - With the exception of building areas, magazines, rail lines and roadways, much of the Main Base is forested. At Site 11, an ordnance disposal area, a potential receptor of contaminant migration is the Knieskern's Beaked Rush, an endangered species. A rare species survey conducted by the New Jersey Department of Environmental Protection confirmed the presence of twelve rare species at NWS Earle. Suitable habitat for several other unconfirmed species was also identified.



**RISK** - Baseline Human Health and Ecological Risk Assessments were completed during FY96 for Sites 1-7, 9-17, 19, 20, 22-27, 29, 35, 41 and 46 and incorporated into the RI Report.

For the DOD Relative Risk Ranking System, 17 sites at the NWS received a high risk ranking. The high ranking was primarily due to groundwater contamination, but contaminants were also found in surface water, sediments and soil. Organics, explosive compounds, metals and petroleum products could affect both human and ecological receptors. There were four sites ranked medium, and ten low. Sites closed out prior to initiation of the ranking system were not evaluated.

A pilot study was initiated in FY96 to determine the optimum method for removal of a free-product fuel layer at Site 16. Vacuum-enhanced extraction was determined to be the preferred remedy. The design for full-scale remediation includes expansion into adjacent UST Site 5.

Removal actions have been completed at six sites where surface soil was impacted. Sites 20, 22, 23 and 27 had visual source areas of paint wastes and Sites 24 and 25 were abandoned pistol ranges. Confirmation sampling indicated no further action is necessary.

An FS was completed for Sites 4, 5, 10, 13, 16, 19, 26 and 35 in FY97 and Remedial Design (RD) for Sites 4 and 5 began and Site 19 was completed. Remedial Action (RA) at Sites 4, 5, 19 and 26 will begin in FY98. RD for Site 3, 10 and 26 is planned for FY98. An FS for Sites 3, 14, 20, 22, 23, 24, 25, 27, and 29 will be completed in FY98. Evaluation of additional sites to determine the appropriate RA will be scheduled on a risk-based priority.

A preliminary Public Health Assessment in 1991 concluded that there was no immediate threat to human health. The Agency for Toxic Substance and Disease Registry (ATSDR) is reviewing the RI report which was completed in FY96.

### REGULATORY ISSUES



**NATIONAL PRIORITIES LIST** - NWS Earle Colts Neck was placed on the National Priorities List (NPL) on 30 August 1990 with a Hazard Ranking System (HRS) score of 37.21. This score was based on numerous landfill sites and a history of ordnance maintenance and disposal operations.



**LEGAL AGREEMENTS** - A Federal Facility Agreement (FFA) between the Department of the Navy and EPA Region II was signed December 1990 and became effective in February 1991. Records of Decision for Sites 4, 5 and 19 were signed in 1997.



**PARTNERING** - No formal partnering sessions have been held, but coordination and cooperation between the Navy, EPA Region II, the New Jersey Department of Environmental Protection (NJDEP) and Monmouth County has been good. A partnering effort between the Navy and the Monmouth County Health Department in 1995 resulted in the development of Geographic Information System (GIS) maps of the installation to improve the decision-making process and to facilitate public involvement. A 1996 data sharing agreement with NJDEP enabled the Navy to overlay state wetland delineations and aerial photos onto these maps.

### COMMUNITY INVOLVEMENT



**RESTORATION ADVISORY BOARD** - A Technical Review Committee (TRC) was formed in FY90 and meetings were held periodically. The TRC was converted to a Restoration Advisory Board (RAB) in FY95. A site visit was conducted in June 1995 for the 20 RAB members. Four RAB meetings were held in FY97 as well as one public meeting to present the Proposed Plans for Sites 4, 5 and 19. Meetings are scheduled at appropriate intervals to allow public input in program decisions.



**COMMUNITY RELATIONS PLAN** - The Community Relations Plan (CRP) was issued in May 1990. It is currently being updated to reflect the progress which has been made.



**INFORMATION REPOSITORY** - An Information Repository was established in FY90 to provide public access to the Administrative Record, the official document file. Copies of the Administrative Record documents are maintained in the Information Repository. It is located at:

Monmouth County Library  
Eastern Branch  
Route 35  
Shrewsbury, New Jersey 07701  
(908) 842-5995/5996/5997

## COLTS NECK NWS EARLE HISTORICAL PROGRESS

### FY83

**Sites 1-29** - An Initial Assessment Study (IAS), equivalent to a Preliminary Assessment (PA), was completed in February 1983 which identified a total of 29 potentially contaminated sites. The study concluded that none of the sites posed an immediate threat to human health and the environment, however, four sites (Sites 2-5) were recommended for further investigation.

**SWMUs 1-34** - The RCRA Facility Assessment (RFA) was completed in FY83. A total of 34 Solid Waste Management Units (SWMUs) were identified. Twenty-nine of these SWMUs were identified in the Initial Assessment Study (IAS) of 1983. Five SWMUs are RCRA regulated units.

**Sites 2-5, 7, 10-11, 19-20, 22 and 26** - A Confirmation Study (CS), equivalent to a Site Inspection (SI), was completed in December 1986. The CS recommended additional sampling including monitoring wells, soil borings and stream sampling for nine sites. No further action was recommended for Sites 20 and 22, however, both were studied further in the RI/FS as required by EPA and state regulators.

### FY88

**Sites 1, 6, 8-9, 12-18, 21, 23-25, 27-29** - The EPA recommended an SI for the remaining 18 sites identified in the IAS.

### FY91

**Sites A-Q** - An aerial photographic interpretation analysis conducted by the Environmental Photographic Interpretation Center (EPIC) for the EPA identified 17 additional sites. Only one of the 17 sites, Site F Building C-50 Roundhouse Area, was recommended for further work. These sites are sometimes referred as Sites 30-46.

**Sites F, L, Q, 1-7, 9-17, 19-20, 22-27 and 29** - The RI/FS began. Although the CS of 1986 recommended no further action for Sites 20 and 22, the EPA and New Jersey Department of Environmental Protection (NJDEP) required the two sites to be included in the RI.

### FY92

**Sites A-Q** - In August, no further action was recommended for 16 of the 17 additional sites. Site F, the C-50 Roundhouse Area, was recommended for further work. After consultation with EPA, Sites F, L and Q went directly to the RI/FS phase.

**UST 1** - A tank site located at Quarters G was investigated following removal of the tank. The site was subsequently closed in July 1992.

### FY93

**Sites 1, 6, 8-9, 12-17, 23-25, 27 and 29** - A Phase II SI was completed. No further action is expected for Sites 8, 12, 15 and 29. LTM is expected for Site 6. Removal actions are anticipated for all remaining sites.

**Sites 14 and 28** - These two sites were excluded from the SI since cleanup efforts were conducted at both sites and sampling had been done at Site 28.

**Sites 18 and 21** - Removal actions were completed. These sites are being addressed further under RCRA.

**UST 8** - Heating oil tanks were removed. A number of tanks in close proximity were found to have leaked. This UST was combined with IR Sites 16 and F into one site now known as Site 16. The soil and groundwater investigation was also incorporated into IR Site 16.

**UST 9** - Spills and overfills caused contamination of soil surrounding two tanks. Contaminated soil was excavated and disposed.

### FY94

**Site 20** - A Work Plan, Action Memorandum and Engineering Evaluation/Cost Analysis (EE/CA) were completed for soil removal.

### FY95

**Sites 1-7, 9-17, 19-20, 22-27 and 29** - The RI Work Plan was completed and field work performed.

**Sites 8, 30-34, 37-40 and 42-45** - Concurrence was received from EPA for no further action required at these sites.

**Sites 18, 21 and 28** - These sites are being addressed under RCRA Corrective Action. Monitoring wells have been installed. A Corrective Measures Study (CMS) and Design have been completed for Site 18 and the Corrective Measures Implementation (CMI) was completed in FY95. Site 28 is Response Complete (RC). Soil removal and groundwater monitoring have been conducted at Site 28. Site 21 is an active, RCRA-permitted storage area.

**USTs 10, 13-14, 18 and 19** - A no further action determination was made.

### FY96

**Sites 1-7, 9-17, 19-20, 22-27, 29, 41 and 46** - The RI was completed. The Draft RI Report was completed in April 1996 and finalized in July 1996. An RI Addendum was initiated to resolve outstanding issues at seven sites.

FSs were started at Sites 4, 5, 19 and 26.

Removal Actions were started at Sites 22, 23, 24, 25 and 27.

**Site 16** - A pilot study was started to determine the optimum method for removal of a free-product layer.

**USTs 11, 12, 16, 17, 20 and 21** - No further action determination was made for these USTs based on RI results.

## PROGRESS DURING FISCAL YEAR 1997

### FY97

**Sites 1-7** - An RI Addendum was completed in FY97 to resolve outstanding issues.

**Sites 20, 22-25 and 27** - Removal Actions were completed.

**Sites 4, 5, 10, 13, 16, 19, 26 and 35** - Feasibility Studies were completed

**Site 19** - RD completed.

**Sites 4, 5 and 19** - Records of Decision were signed.

**UST 2 and 7** - CAP completed.

**UST 5 and 9** - RD completed. RA for UST 5 will include CERCLA Site 16.

**UST 2 and 7** - Response Complete.

## COLTS NECK NWS EARLE PLANS FOR FISCAL YEARS 1998 AND 1999

**FY98**

Sites 3, 14, 20, 22, 23, 24, 25, 27 and 29 - Complete FS.  
 Site 19 - Complete RA.  
 UST 5 and 9 - Complete IMP.  
 Sites 3, 10, 13 and 26 - Records of Decision (RODs) are planned.  
 Sites 14, 20, 22-25, 27 and 29 - No Further Action RODs are planned.  
 Sites 3, 10 and 26 - RD will begin.  
 Sites 4 and 5 - Complete RD.  
 Sites 12 and 19 - Removal Actions will be performed.  
 Site 2 - Long Term Monitoring (LTM) will continue under terms of the RCRA Subpart X Permit.  
 Sites 14, 20, 22,-25, 27, 29 and UST 9 - will be Response Complete.

**FY99**

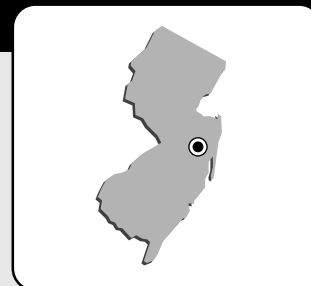
Site 13 - RD will begin.  
 Sites 3, 10, 13 and 26 - Complete RD.  
 Sites 3, 10 and 26 - RA will begin.  
 Sites 4 and 5 - Complete RA.  
 Sites 6 and 17 - An interim action will be initiated.  
 Sites 7 and 9 - An FS will begin.  
 Sites 1 and 2 - Complete FS.  
 UST 3 - Complete CAP and IMP.  
 Sites 1, 2 and UST 3 - Response Complete.

**PROGRESS AND PLANS**

<b>CERCLA</b>	<b>FY96 and before</b>	<b>FY97</b>	<b>FY98</b>	<b>FY99</b>	<b>FY00</b>	<b>FY01</b>	<b>FY02</b>	<b>FY03 and after</b>
PA / SI	43							
RI / FS		8	9	2	1	2	6	
RD		1	2	4			2	3
RAC			1	2	1	3		5
RAO						2		11
IRA	1(1)	6(6)	2(2)		2(2)			
RC	15		8	2	1	2	3	12
Cumulative % RC	35%	35%	53%	58%	60%	65%	72%	100%
<b>RCRA CA</b>	<b>FY96 and before</b>	<b>FY97</b>	<b>FY98</b>	<b>FY99</b>	<b>FY00</b>	<b>FY01</b>	<b>FY02</b>	<b>FY03 and after</b>
RFA	1							
RFI / CMS	1							
DES	1							
CMI	2							
CMO								
IRA	1(1)							
RC	3							
Cumulative % RC	100%	100%	100%	100%	100%	100%	100%	100%
<b>UST</b>	<b>FY96 and before</b>	<b>FY97</b>	<b>FY98</b>	<b>FY99</b>	<b>FY00</b>	<b>FY01</b>	<b>FY02</b>	<b>FY03 and after</b>
SA								
CAP	18	2		1				
DES		2						
IMP	1		2	1				
IMO						1		
IRA	2(3)							
RC	16	2	1	1		1		
Cumulative % RC	76%	86%	90%	95%	95%	100%	100%	100%

# LAKEHURST NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION NEW JERSEY

Engineering Field Division/Activity: NORTHDIV  
Major Claimant: COMNAVAIRSYSCOM  
Size: 7,382 Acres  
Funding to Date: \$34,342,000  
Estimated Funding to Complete: \$46,633,000



Base Mission: Develops and tests weapons systems and their components

Contaminants: Acids, fuels, PCBs, pesticides/herbicides, photographic chemicals, refrigerants, solvents, waste oils

## Number of Sites:

CERCLA: 45  
RCRA Corrective Action: 0  
RCRA UST: 0  
Total Sites: 45

## Relative Risk Ranking of Sites:

High: 10 Not Evaluated: 0  
Medium: 0 Not Required: 35  
Low: 0

**NPL**

Sites Response Complete: 35

## EXECUTIVE SUMMARY

The Lakehurst Naval Air Engineering Station (NAES) is located in Jackson and Manchester Townships, Ocean County, New Jersey, 14 miles inland from the Atlantic Ocean. Lakehurst is 65 miles south of New York City and 50 miles east of Philadelphia, Pennsylvania. NAES is bordered by Route 547 to the east, a military reservation to the west, woodland to the north and south. NAES and the surrounding areas are within the Pinelands National Reserve, the most extensive undeveloped land tract of the Middle Atlantic Seaboard. There are rare, threatened, and endangered species within the Pinelands unique ecosystem.

NAES covers 7,382 acres on an outer coastal plain, an area of gently rolling terrain and low relief. Drainage from NAES discharges to several tributaries which flow into two major streams. The Ridgeway Branch runs along the northern border of NAES and the Manapqua Brook along the southern border. Both streams flow into Pine Lake which discharges into the Toms River.

NAES was formerly named the Naval Air Engineering Center (NAEC), but was renamed Naval Air Warfare Center (NAWC) Aircraft Division in 1992. In January 1994, the facility was renamed Naval Air Engineering Station (NAES), due to continued reorganization within the Department of the Navy.

The current mission is technology development and engineering. Past operations include the handling, storage, and on-site disposal of hazardous substances. Historical records, aerial photographs, field inspections, and interviews, were used to identify 45 potentially contaminated sites. The primary contaminants are petroleum products in soil and volatile organic compounds (VOCs) in groundwater. The first Federal Facility Agreement (FFA) was signed between the Navy and the EPA in October 1989 for NAES.

There are 45 IR sites at NAWC. At the end of FY97, 10 sites were in the cleanup phase, 2 sites were in the long-term monitoring phase, and 35 sites

are Response Complete (RC). Groundwater is being treated by pump and treat systems at four sites, spray irrigation treatment at one site, and free-product extraction at one site. Groundwater at one site is undergoing a pilot for natural restoration. Soil at three sites is being treated via bioventing/vapor extraction.

An interim ROD was signed in FY91, to implement groundwater treatment at Area E and in FY92 at Areas A/B. RODs for the final groundwater actions for Areas A/B and E were completed in FY97. A ROD for groundwater monitoring was signed in FY93 for Sites 1 and 31. A final ROD for Area K was completed in FY97. An interim ROD to conduct a three year natural restoration pilot at Areas I and J was signed in FY95 with a final ROD at Areas I and J anticipated in FY99. Anticipate final RODs for all sites by the end of FY99.

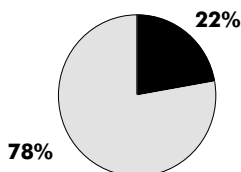
A Technical Review Committee (TRC), established in 1987, includes the Navy, EPA, New Jersey Department of Environmental Protection (DEP), and the Pinelands Commission. The TRC meets monthly to discuss the status of the National Priorities List (NPL) sites. A Restoration Advisory Board (RAB) was established in November 1994. Meetings are held bi-monthly. A Community Relations Plan (CRP) was completed in 1988. An Information Repository is located at the Ocean County Library in Toms River, New Jersey.

Innovative technologies have been implemented at NAES. Bioremediation was used successfully in 1983 and soil washing in 1988. Asphalt batching (combining contaminated soil with an emulsion to create a base for roadways) was used in 1994. The use of "passive soil gas survey" at Site 14, clarified the higher areas of contamination in a closed landfill. At Site 31, this technology was used in a wetlands area to indicate the extent of petroleum products contamination. NAES created a Geographic Information System (GIS) that makes site data a manageable asset.

In FY93, the installation developed in-house expertise in groundwater modeling to predict the movement of contaminated groundwater plumes. Modeling has helped to support and build consensus for the use of natural attenuation as the proposed action for a large TCE plume, an option that will cost less than one percent of the cost of a pump and treat system.

Several Navy environmental awards were received by NAES: State Coordinator, New Jersey, 1990; Environmental Engineer of the Year, 1991; Environmental Team, 1992; and Pollution Prevention and Recycling, 1993. Other awards were Department of Defense (DOD) Environmental Showcase Installation, 1992 and the Al Gore Adopt-A-School Program, 1993.

## Current Status Of Sites



■ Studies Underway 0  
■ Cleanups Underway 10  
□ Response Complete 35  
**TOTALS 35**

## LAKEHURST NAWCAD RELEVANT ISSUES

### ENVIRONMENTAL RISK



**HYDROGEOLOGY** - Groundwater represents the primary source of potable water supply in Ocean County. Groundwater pollution occurs at NAES. Approximately 20" of rainfall is available per year to recharge the groundwater reservoir. This quantity of water moving down through the very permeable sands blanketing NAES is a sufficient vehicle to carry pollutants to the groundwater. Once there, the lateral migration is also essentially uninhibited by the permeable sands. Surface runoff amounts to 5-10 inches annually and could readily transport surface pollutants from the bounds of NAES.



**NATURAL RESOURCES** - NAES overlies the Cohansey Sand, an important fresh water aquifer. There are five freshwater areas at NAES; Bass Lake, Clubhouse Lake, Pickerel Pond, Island Pond, and Rainbow Pond. Many of the areas are used for recreational purposes. There are rare, threatened, and endangered species within the areas surrounding NAES.



**RISK** - All 45 IR sites were ranked using the Department of Defense (DOD) Relative Risk Ranking System. Ten sites were ranked high primarily due to groundwater contamination and also some soil contamination. There are both human and ecological receptors. Contaminants include solvents, gasoline and diesel fuels, fire fighting foam (FFF) and landfill debris.

The Agency for Toxic Substances and Disease Registry (ATSDR) prepared a Preliminary Public Health Assessment in 1989. At that time, NAES was considered to be of risk to human health due to the possibility of exposure to hazardous substances via contaminated groundwater, soil, sediment, and surface water.

In April 1992, an Endangerment Assessment (EA) for NAES was conducted. Again, based on available information, NAES was considered to be a potential public health concern because of the risk to human health due to the possibility of exposure to hazardous substances via contaminated groundwater, soil, sediment, and surface water.



**RESTORATION PROJECTS** - A Feasibility Study (FS) will be performed in July 1998 for Areas I and J, where a natural restoration pilot is currently underway.

### REGULATORY ISSUES



**NATIONAL PRIORITIES LIST** - The installation was placed on the National Priorities List (NPL) on 22 July 1987 with a Hazard Ranking System (HRS) score of 50.53. Placement on the NPL was due to groundwater contamination, as groundwater in the area is a source of potable water.



**LEGAL AGREEMENTS** - A Federal Facility Agreement (FFA) was signed by the Department of the Navy (DON) on 25 May 1989 and by the EPA on 4 October 1989.

No Further Action (NFA) Records of Decision (RODs) were signed for Sites 2, 5, 7, 9, 11, 12, 15, 18-24, 26, 27, 30, 33-40, 44 and 45 prior to FY94.

Interim RODs were signed in February 1991, to implement groundwater treatment at Sites 10, 16, 17 (Area C) and Site 32 (Area H). Final RODs to continue groundwater treatment with modifications to improve system performance at Areas C and H and soil treatment systems at Sites 16 and 17 were signed in February 1996.

An interim ROD was signed in September 1991, for groundwater treatment at Site 28 (Area E) and in March 1992, for groundwater treatment at Sites 13, 14, 29 and 42 (Areas A and B). Final RODs for Areas A and B and Area E were completed in FY97. The final action for Area E includes a vapor extraction/sparging system to treat source areas and accelerate groundwater remediation. The final action for Areas A and B includes the addition of free-product extraction and sparge well systems.

A ROD for groundwater monitoring was signed in FY93 for Sites 1 and 31. An interim ROD to conduct a three year natural restoration pilot at Sites 3, 6 and 25 (Areas I and J) was signed in January 1995 with a final ROD at Areas I and J anticipated in FY99. A final ROD for Sites 4 and 8 (Area K) was completed in FY97. NAWC anticipates final RODs for all sites by FY99.



**PARTNERING** - Partnerships were established with the United States Geological Survey (USGS), Rutgers University, the New Jersey Department of Environmental Protection (DEP), and the Pinelands Commission to study the use of composted biosolids to minimize disturbances that may occur during site recovery. These materials may be used for capping or fill material.

The NAES Environmental Branch and a Manchester Township High School developed a summer science program called Research Methods in Ecology and Environmental Sciences. The program is designed to encourage and nurture student careers in science and ecology, while providing valuable information for NAES. Students work side by side with environmental professionals on guided research projects.

### COMMUNITY INVOLVEMENT



**RESTORATION ADVISORY BOARD** - A Technical Review Committee (TRC) was established in FY87 and includes members of the Navy, EPA, New Jersey DEP, and the Pinelands Commission. The TRC meets monthly to discuss the status of the NPL sites. A Restoration Advisory Board (RAB) was established in November 1994. Meetings are held bi-monthly and "walk-ins" are encouraged. RAB meetings are advertised in the local newspaper and through posters displayed throughout the community. All members of the public are invited to attend.



**COMMUNITY RELATIONS PLAN** - A comprehensive Community Relations Plan (CRP) was completed in February 1988.



**INFORMATION REPOSITORY** - An Information Repository has been established, containing copies of all Administrative Records (official records), including minutes from TRC and RAB meetings.

Ocean County Library  
101 Washington Street  
Toms River, New Jersey 08753

## LAKEHURST NAWCAD HISTORICAL PROGRESS

### FY81

Sites 1, 2, 15, 19, 22, 23, 26 and 30 - Removed stained and contaminated soils and removed drums, tanks and debris.  
Site 11 - A Removal action for soils began.

### FY83

Sites 1-44 - The Initial Assessment Study (IAS), equivalent to a Preliminary Assessment (PA), and a Confirmation Study (CS), equivalent to a Site Inspection (SI), identified 44 potentially contaminated sites at Lakehurst NAWC. Site 45, a former BOMARC missile site, was added to the list of potentially contaminated sites for further study. BOMARC is the responsibility of the US Air Force and is located on Fort Dix property.

### FY87

All Sites - The SI was completed and all sites were recommended for further study in the Remedial Investigation/Feasibility Study (RI/FS).  
Sites 1-4, 6-14, 16, 17, 20, 22, 24, 25, 28, 29, 31-33, 35-39 and 42 - Phase II RIs were completed.  
Sites 5, 15, 18, 19, 21, 27, 30, 34, 40 and 45 - An RI was completed.  
Sites 15, 18, 27, 30, 34, 40 and 45 - The RI/FS phase was completed.

### FY91

Sites 5, 19, 21 and 44 - Removal actions to remove contaminated soil were completed.  
Sites 10, 16 and 17 (Area C Groundwater) - Groundwater treatment began.

### FY92

Site 29 - Drums were removed.  
Sites 1, 6, 20 and 35 - Removal actions to remove stained and contaminated soils took place.  
Site 28 (Area E Groundwater) - An Interim Remedial Action (IRA) for groundwater treatment began.  
Area H - An IRA for groundwater treatment began in May 1992.

### FY93

Sites 1, 2, 11, 20, 35 and 38 - A Phase III RI/FS was completed.  
Sites 11 and 35 - The RI/FS phase was completed.  
Sites 3, 4, 6-9, 13, 14, 16, 22, 24 and 32 - A FS was completed.  
Site 29 - More drums were excavated and removed.  
Sites 1 and 38 - The FS phase was completed.  
Sites 2, 20, 26, 36, 37, 39, 42 and 44 - The FS phase was completed.  
Sites 3, 6, 14, 16 and 32 - The Remedial Design (RD) was completed.

### FY94

Site 13 - The RD phase was completed.  
Sites 6, 14, 16 and 32 - The final Remedial Actions (RAs) began.  
Sites 3, 6, 14, 16, 29 and 32 - Soil removal was completed and soil was asphalt batched to construct new roads off base.  
Sites 12, 23-25, 29, 31 and 33 - An FS was completed.  
Sites 16 and 17 - The IRA for removal of contaminated soils was completed in October 1993 with confirmation sampling results March 1994. No Further Action (NFA) is expected after the IRAs are done.  
Areas A, B, I and J - IRAs for the groundwater involving pump and treat operations began.

### FY95

Sites 13, 16 and 17 - An in-house design of bioremediation and vapor extraction systems was completed.  
Sites 3 and 6 (Areas I and J) - A revised Record Of Decision (ROD) was completed in January 1995.  
Sites 10, 16, 17 (Area C) and Site 32 (Area H) - FSs were conducted in May 1995, to assess the performance of the interim groundwater and soil treatment actions at these sites.

### FY96

Areas C and H - RODs for continued groundwater treatment with modifications to improve system performance completed in February 1996.  
Site 6 (Area I) and Site 42 (Area A) - In-house remedial design specifications for system modifications were completed in September.  
Site 3 (Area J), 8 (Area K), 31 (Areas D and H) and Sites 13 and 14 (Areas A/B) - Feasibility Studies were completed in July.  
Area I/J - Started Natural Restoration  
Site 13 - Started Vapor Extraction Treatment  
Sites 16 and 17 - Started Bioventing/Vapor Extraction Systems  
Sites 6 and 42 - Completed Remedial Design.  
Sites 3, 6, 10, 16 and 42 - Completed Remedial Action.  
Sites 1, 4 and 41 - Completed IRAs.  
Sites 3, 7, 8, 10 and 31 - Response Complete.

## PROGRESS DURING FISCAL YEAR 1997

### FY97

Area K, Area E and Area A/B - RODs signed. Dual Phase Extraction and sparge wall systems in Area A/B to be completed.  
Sites 16 and 23 - completed RI/FS.

Sites 14 and 28 - Completed RD.  
Site 16 - Completed RA.  
Sites 14, 15 and 45 - Removal Action Completed.  
Site 41 - Response Complete.

## LAKEHURST NAWCAD PLANS FOR FISCAL YEARS 1998 AND 1999

### FY98

Area C, Area H, Area E, and Areas A/B - Modify groundwater treatment systems.  
 Areas I and J - Complete final FS  
 Area K (Site 4) - Groundwater Treatment system design and construction to be completed.  
 Site 4 - Complete RD.  
 Site 4, 14 and 28 - Complete RA.  
 Site 14 - Complete RI/FS.

### FY99

Site 6 - Complete RA.  
 Site 3 - Complete Removal Action.  
 Site 6 - Response Complete is planned.  
 Areas I and J - Complete the Final Proposed Plan, Record of Decision (ROD) and sign the Final ROD.  
 Basewide - Start Preparation of Delisting Plan.

## PROGRESS AND PLANS

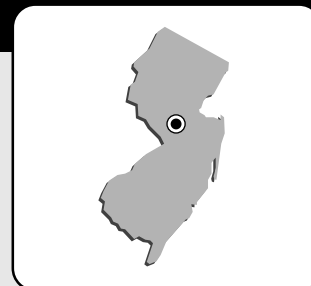
CERCLA	FY96 and before	FY97	FY98	FY99	FY00	FY01	FY02	FY03 and after
PA / SI	44							
RI / FS	42	2	1					
RD	7	2	1					
RAC	7	1	3	1				
RAO								9
IRA	2(32)	3(3)		1(1)	1(1)			
RC	34	1		1				9
Cumulative % RC	76%	78%	78%	80%	80%	80%	80%	100%



# TRENTON NAVAL AIR WARFARE CENTER

## TRENTON, NEW JERSEY

Engineering Field Division/Activity: NORTHDIV  
 Major Claimant: COMNAVAIRSYSCOM  
 Size: 54 Acres  
 Funding to Date: \$10,944,000  
 Estimated Funding to Complete: \$7,804,000



Base Mission: Develops and tests aircraft engines

Contaminants: Heavy metals (cadmium, chromium, lead), POLs, solvents, volatile organic compounds

Number of Sites:	Relative Risk Ranking of Sites:				
CERCLA:	9	High:	2	Not Evaluated:	0
RCRA Corrective Action:	0	Medium:	0	Not Required:	9
RCRA UST:	2	Low:	0		
Total Sites:	11				

**BRAC III**

Sites Response Complete: 9

### EXECUTIVE SUMMARY

Trenton Naval Air Warfare Center (NAWC) is located 30 miles northeast of Philadelphia, Pennsylvania and consist of 54 acres. The Delaware River is two miles to the south. Operations that contributed to contamination at NAWC were research, development, and testing of engine systems and components, vehicle maintenance, painting, pipe fitting, welding, pest control, fire fighter training, and material storage and handling. The primary sites of concern are contaminated groundwater, spill sites, disposal areas, and Underground Storage Tanks (USTs). Primary contaminants are fuels and solvents. The organic solvent TCE was used extensively throughout the facility as a coolant for testing jet engines and other aircraft equipment.

Trenton NAWC is situated in the Piedmont Lowlands consisting of undulating ridges and nearly level to gentle slopes. There are very few natural lakes and no marshy areas in the Piedmont Lowlands. Three streams flow through the area and drain into the Delaware River. However, only one, Gold Run, receives runoff from NAWC. Surface water runoff has the potential to transport contaminants to the Delaware River which is used as a drinking water source. The groundwater aquifers underlying NAWC are also used for drinking water. The base is surrounded by industrial, commercial, agricultural and residential property.

The major area of concern to the local community is the groundwater which is contaminated with the organic solvent TCE. A pump and treat system is in operation to contain contaminated groundwater posing a potential risk to off-site residential wells. The United States Geological Survey (USGS) performed borehole geophysics and worked with the Navy performing aquifer tests to enable the Navy to accurately place future monitoring wells for delineation of the plume. In June 1996, the design of a modified treatment plant was completed. During FY96 the installation also initiated phase II of the EBS for 3 parcels of property and completed a Land Reuse Plan.

There are nine IR sites, seven are CERCLA sites and two are UST sites identified at NAWC. At the end of FY96, seven sites were in the Study Phase. The two UST sites have Response Complete (RC). For Site 3, Remedial Action was completed in FY96. The Remedial Investigation for Site 2 and Sites 4 through 9 were completed in FY97. At the end of FY98, all sites will have completed Remedial Investigation/Feasibility Study (RI/FS) studies. A No Further Action (NFA) decision document has been submitted to regulators for six of nine CERCLA sites. Sites 1 and 8 are expected to complete a RI/FS, RA and ROD in FY98.

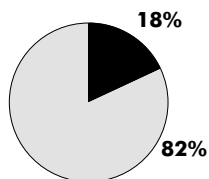
Several removal actions have been conducted at NAWC. A tank at UST 2 and surrounding contaminated soil were removed in FY92. At UST 1, a tank and contaminated soil were removed in FY93. No further work is expected at Site 3 after the remediation decision document is completed in FY98.

The final design to remediate and contain groundwater contamination is scheduled for completion in FY98. The addition of an iron filing treatment system to address high levels of the organic solvent TCE in groundwater was installed in FY97. This method provides a low cost and low maintenance system to treat high levels of the organic solvent TCE in groundwater.

In FY93, the Base Realignment and Closure (BRAC) Commission recommended Trenton NAWC for closure. Operational closure is scheduled for September 1998. After closure, operations will be relocated to the Arnold Engineering Development Center in Tullahoma, Tennessee, and the NAS in Patuxent River, Maryland.

Community outreach efforts were expanded with the formation of the BRAC Cleanup Team (BCT) in FY94. The BCT prepared a BRAC Cleanup Plan (BCP) and developed a partnering agreement that established goals for meaningful community involvement in the cleanup process and to keep cleanup on the fast track. As part of the partnering effort, reuse committee members provided input on the Environmental Baseline Survey (EBS). To accelerate community reuse of installation property, one building has been leased to a local company on an interim basis. The installation has been divided into three property parcels. Phase II of the EBS began in August 1996 on the six property parcels. One ten acre area has been identified as Community Environmental Response Facilitation Act (CERFA) clean. The reuse committee completed a Reuse Plan in June 1996.

#### Current Status Of Sites



■ Studies Underway	0
■ Cleanups Underway	2
□ Response Complete	9
<b>TOTALS</b>	<b>11</b>

## TRENTON NAWC RELEVANT ISSUES

### ENVIRONMENTAL RISK



**HYDROGEOLOGY** - Trenton NAWC lies within the Gold Run Drainage Basin. Storm water runoff from the base empties into Gold Run Creek, a tributary of the Delaware River. No streams, creeks or lakes are located on NAWC property. Four aquifers in Mercer County serve as sources of groundwater. The Stockton and Lockatong Formations are the two most important, and both of these aquifers underlie NAWC. The Stockton Formation is an excellent source of groundwater and contains two aquifer systems, water table and artesian. The Lockatong has less capacity to store and transmit water. NAWC pumps industrial and drinking water from the Delaware River. The three potential contaminant migration pathways at Trenton are groundwater transport in the water table aquifer, groundwater transport in the artesian aquifer, and surface water runoff to receiving streams.



**NATURAL RESOURCES** - NAWC is in a highly developed, urbanized area. No natural biological communities exist within the confines of the security fences. Nearby Mercer County Airport is the largest open area in the vicinity that may be a breeding ground for various animals. Areas on NAWC without buildings, roadways, or parking facilities are limited to maintained fields or lawn. Wooded or even old field habitat does not exist, and no natural aquatic habitat is found on NAWC. Wildlife occurring on the activity is limited to species that adapt well to urbanized environments. Mammals that may be found on the grounds include raccoon, opossum, Norway rat, cottontail rabbit, squirrel and mice. Birds that frequent the area include English sparrows, starlings, mourning doves, and swifts. Fish species in the Gold Run Creek include chub, dace, shiners, sunnies, bluegills, largemouth bass, smallmouth bass, walleye, carp, and pickerel. Sport fishing is popular in the Delaware River and the nearby Raritan Canal.



**RISK** - Under the Department of Defense (DOD) Relative Risk Ranking System, only two sites received a high risk ranking. Site 1 was ranked high due to groundwater contamination with potential human receptors. Groundwater treatment is underway at Site 1.

### REGULATORY ISSUES



**PARTNERING** - The BRAC Cleanup Team (BCT) developed a partnering agreement that established a series of goals for meaningful community involvement in the cleanup process. As part of this partnering effort, reuse committee members provided input on the Environmental Baseline Survey (EBS).

### COMMUNITY INVOLVEMENT



**RESTORATION ADVISORY BOARD** - A Technical Review Committee (TRC) was formed in FY91 and was converted to a Restoration Advisory Board (RAB) in FY93. The RAB consists of 12 members from the Navy, EPA, state, and community. The first RAB meeting, held in FY94, was open to the public. Meetings are held quarterly.



**COMMUNITY RELATIONS PLAN** - A Community Relations Plan (CRP) was completed in September 1993. NAWC has excellent community relations and has distributed fact sheets to keep the public informed.



**INFORMATION REPOSITORY** - An Information Repository was established in August 1991. It is located at the Ewing Township Library for public access and contains copies of the documents in the Administrative Record.

### BASE REALIGNMENT AND CLOSURE



**BRAC** - Trenton NAWC was recommended for closure. Operational closure is scheduled for September 1998. After closure, operations will be relocated to the Arnold Engineering Development Center in Tullahoma, Tennessee, and the NAS in Patuxent River, Maryland.



**BRAC CLEANUP TEAM** - Members are from the Navy, New Jersey Department of Environmental Protection, EPA Region II and the community. The BRAC Cleanup Team (BCT) developed a partnering agreement that established a series of goals for meaningful community involvement in the cleanup process. As part of this partnering effort, reuse committee members provided input on the EBS.



**DOCUMENTS** - A completed BRAC Cleanup Plan (BCP) was prepared by the BCT to identify opportunities for streamlining and accelerating the cleanup process and facilitating community involvement. A draft EBS has been done and Phase II of the EBS was underway in 1997 and will be completed in early 1998.

#### Environmental Conditions of Property Classification

1	2	3	4	5	6	7
10 acres	26 acres	0 acres	0 acres	10 acres	13 acres	7 acres



**LEASE/TRANSFER** - A Finding of Suitability for Transfer (FOST) was completed in FY97 for a 10 acre parcel.



**REUSE** - The reuse plan was completed in FY96 and the Draft Environmental Impact Statement (EIS) was completed in FY97. Proposals have been made for potential reuse. Screening for Department of Defense (DOD) and Federal Agencies has been completed.

## HISTORICAL PROGRESS

### FY86

**Sites 1-7** - An Initial Assessment Study (IAS), equivalent to a Preliminary Assessment (PA), identified seven potentially contaminated sites. All seven sites were recommended for further study.

### FY90

**Sites 8 and 9** - These sites were identified during the Site Inspection (SI).  
**USTs 1 and 2** - These two UST sites were identified.

### FY92

**UST 2 ( Public Works Gas Station)** - Removal of tank and surrounding contaminated soil was completed.

### FY93

**UST 1** - Removal of tank and surrounding contaminated soil was completed.

### FY94

**Site 3** - Sludge removal began.

## TRENTON NAWC HISTORICAL PROGRESS

### FY95

Site 1 - The start-up of a fast track interim treatment plant for the organic solvent TCE groundwater contamination began. The redesign of the interim treatment plant began in September.

Site 3 - Sludge was removed.

Sites 2, 4, 5, 6, 7 and 9 - A draft No Further Action Decision document was completed.

### FY96

Site 1 - Completed the redesign of the interim treatment plant. Tasked contractor to install monitoring wells. Started the design of an Iron fillings treatment system.

Site 3 - Completed design and Remedial Action for sludge removal.

## PROGRESS DURING FISCAL YEAR 1997

### FY97

Sites 2, 3, 5, 6, 7 and 9 - Regulatory review delayed completion of Decision Documents for six sites. Well installation began in November 1996 and was completed in June 1997. The Draft EIS was completed in September 1997.

Site 1 - Construction of the modified treatment plant for groundwater treatment was completed in March 1997.

Sites 2 and 4-9 - The Remedial Investigation (RI) phase was completed.

Site 8 - A Draft closure plan was completed in July 1997.

## PLANS FOR FISCAL YEARS 1998 AND 1999

### FY98

Site 1 - RI/FS will be completed.

Site 1 - The design of the final treatment system for groundwater contamination will be completed.

Sites 2-7 & 9 - Completion of NFADD.

Sites 1 and 8 - RA and ROD are scheduled for completion.

### FY99

Site 1 - Ongoing Operation and Maintenance of groundwater treatment.

## PROGRESS AND PLANS

CERCLA	FY96 and before	FY97	FY98	FY99	FY00	FY01	FY02	FY03 and after
PA / SI	9							
RI / FS	1	8						
RD		1	2					
RAC		1	1	1				
RAO								1
IRA		1(1)	1(1)					
RC		7	1					1
Cumulative % RC	0%	78%	89%	89%	89%	89%	89%	100%
UST	FY96 and before	FY97	FY98	FY99	FY00	FY01	FY02	FY03 and after
SA								
CAP	2							
DES	1							
IMP	2							
IMO								
IRA	2(4)							
RC	2							
Cumulative % RC	100%	100%	100%	100%	100%	100%	100%	100%